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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,932	11/18/2003	Susumu Ogawa	HITA.0460	3018

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REED SMITH LLP
3110 FAIRVIEW PARK DRIVE, SUITE 1400
FALLS CHURCH, VA 22042

EXAMINER

RODRIGUEZ, GLENDA P

ART UNIT	PAPER NUMBER
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2651

DATE MAILED: 11/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/714,932

Applicant(s)

OGAWA ET AL.

Examiner

Glenda P. Rodriguez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/30/05.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (US Patent No. 6, 501, 611) in view of Hara et al. (US Patent No. 6, 770, 386).

Regarding Claims 3 and 4, Li teaches an apparatus wherein comprising:

At least one metal probe (Fig. 1, Element 20, which is a transducer, which as a reading/recording probe according to the Applicant's Specification);

Wherein said at least one metal probe is structured so that a distance between said at least one metal probe and said film is controlled so as not to contact said film (See Summary of Li, wherein it teaches an apparatus that controls the head to disk spacing by means of detecting its temperature in order to evade head to disk contact.);

A controller whereby an electric field between said at least one metal probe and said film is provided to become the height of the potential barrier being effectively high or low compared with a reference value for recording information to the multilayer film corresponding to said electric field by changing at least one direction of magnetization of said ferromagnetic metallic layers (See Fig. 3, wherein it teaches two thresholds in Elements 88 and 91, each comparing as to

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whether the temperature of the head with respect to the disk being too high or too low and hence noting if the head (or probe) is too far or too close from the disk as to make an error. It is obvious to a person of ordinary skill in the art, that when recording is being performed, at least one direction of magnetization (or bit cells) will vary in direction when recording is being done.);

And wherein said at least one metal probe is structured so that between said at least one metal probe and said film, there is applied a voltage for flowing tunnel current through to read information recorded by a change in said tunnel current corresponding to a change in a direction of magnetization due to electric field which corresponds to the read information (See Summary and Description of Fig. 3, wherein the read element acknowledges by means of comparison, detect a variation of fly-height and taking the necessary recovery steps (Element 86)).

Li teaches a ferromagnetic layer facing a transducer (or magnetic probe) as seen in fig 1. However, Li does not explicitly teach wherein a multilayer film comprising a first ferromagnetic metallic layer, a middle non-magnetic metallic layer formed on the first ferromagnetic metallic layer, and a second ferromagnetic metallic layer formed on the middle non-magnetic metallic layer. Hara et al. teaches this limitation in Fig. 4, wherein Elements 33 and 31 are ferromagnetic layers and 32 is a nonmagnetic layer. It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify the invention of Li with the limitation of Hara et al. in order to increase the disk's track density by having two ferromagnetic areas wherein data can be recorded as taught in the Description of Prior Art of Hara et al.

Method claim (1) is drawn to the method of using the corresponding apparatus claimed in claim (4). Therefore method claim (1) corresponds to apparatus claim (1) and is rejected for the same reasons of obviousness as used above.

3. Claim 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li and Hara et al. as applied to claim 4 above, and further in view of Akiyama et al. (US Patent No. 5, 949, 600).

Regarding Claim 5, the combination of Li and Hara et al. teach all the limitations of Claim 4. However, Li and Hara do not explicitly teach a slider. Akiyama et al. teach wherein metal probe opposes said multilayer film at the tip of the end of the arm, one of which is rotatably supported and the other end is extended to said disk-shaped medium (Col. 2, L. 23-25); at the arm there is a slider (See Abstract Akiyama et al.); whereby a distance between said metal probe and said multilayer film is controlled by said slider so that the at least one metal probe will not contact said multilayer film (Col. 8, L. 12-24 and Col. 11, L. 44-56); and wherein said at least one metal probe is structured so that an electric field between said at least one metal probe and said multilayer film is controlled to change at least one direction of magnetization of said ferromagnetic metallic layer for recording information corresponding to said electric field (Col. 1, L. 49-60, wherein Akiyama teaches sending a tunnel current (which is known to produce an electric field) through the probe to the disk). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify the combination's invention with the teaching of Akiyama et al. in order to improve linear recording density in the disk according to the Description of the Related Art of Akiyama et al.

Regarding Claim 8, the combination of Li and Hara et al. teach all the limitations of Claim 3. However, Li and Hara wherein the ferromagnetic metallic layer of said multilayer film, which faces said metal probe is made into domains which have been spatially divided in units of information to be recorded. Akiyama et al. teaches this limitation in Col. 1, L. 49-60 (It is obvious that the signals being magnetized is known to be data (i.e. servo or user)).

4. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li and Hara et al. as applied to claims 1 and 3 above, and further in view of Gill (US Patent No. 6, 650, 512). Regarding Claims 2 and 9, the combination of Li and Hara et al. teaches all the limitations of Claims 1 and 3, respectively. However, the combination does not distinctively teach wherein providing an anti-ferromagnetic layer between the first ferromagnetic layer and the substrate. Gill teaches an anti-ferromagnetic layer between the first ferromagnetic layer and the substrate (Col. 12, L. 50 to Col. 13, L. 10). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify the combination's invention with the teaching of Gill in order to provide more efficient magnetization to the medium.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li, Hara et al. and Akiyama et al. as applied to claims 1 and 3 above, and further in view of Gill (US Patent No. 6, 650, 512). Regarding Claim 6, the combination of Li, Hara et al. and Akiyama et al. teach all the limitations of Claim 5. However, the combination does not explicitly teach information being recorded by a provided GMR element or a TMR element. Gill does teach the use of a GMR element to control the magnetization in a disk (See Abstract of Gill). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify

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Akiyama et al.'s invention with the teaching of Gill in order to provide more efficient magnetization to the medium.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li and Hara et al. as applied in Claim 4, further in view of Kobayashi (US Patent No. 6, 687, 200). The combination of Li and Hara et al. teach all the limitations of Claim 4. However, the combination does not explicitly teach a plurality of probes. Kobayashi teaches a plurality of probes for magnetization of a media (Col. 21, L. 3-12). It would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to modify the combination's invention with the teaching of Kobayashi in order to control the magnetization in the media.

Response to Arguments

7. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection due to the newly amended Claims.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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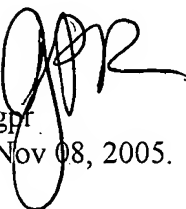
however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Glenda P. Rodriguez whose telephone number is (571) 272-7561.

The examiner can normally be reached on Monday thru Thursday: 7:00-5:00; alternate Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


gpr
Nov 08, 2005.


DAVID HUDSPETH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600